UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
KNOX CITY, TEXAS

NOTICE OF RELEASE OF SAN MARCOS GERMPLASM EASTERN GAMAGRASS SELECTED CLASS OF NATURAL GERMPLASM

The Natural Resources Conservation Service, U.S. Department of Agriculture announces the release of a selected ecotype of eastern gamagrass, *Tripsacum dactyloides* (L.) L.

As a selected release this plant will be referred to as San Marcos Germplasm eastern gamagrass. It has been assigned the Plant Introduction Number (PI) 434493. San Marcos Germplasm is released as a selected class of certified seed (natural track).

This alternative release procedure is justified because there are presently no commercial varieties of eastern gamagrass adapted for use in central and south-central Texas.

Collection Site Information: San Marcos Germplasm was originally collected from seed in 1964 from native plants located in Hays County, Texas near the town of San Marcos. Elevation for the area is approximately 800 feet; the soil at the collection site is classified as Houston Black Clay. Average precipitation for the area is around 33 inches. Other plants growing in association would have included vine mesquite, little and big bluestem, switchgrass, Indiangrass and wildryes. The collection site is located in MLRA 86A - Northern Blackland Prairie.

Description: San Marcos Germplasm Eastern gamagrass is a tall perennial, warm-season, native bunchgrass. Eastern gamagrass occurs naturally over much of the Midwest, Southern, and Eastern US. It spreads by thick (1/2 to 1 inch) rhizomes and produces seed from July to September on stems 3 to 9 feet tall. The seed heads consist of 1 to 3 spikes with the pistillate (female) part below and the staminate (male) part above. The 6 to 10 inches long seed heads have seeds that are sunken in the joints of the lower one-fourth of the spike. The seed matures unevenly with the uppermost maturing first. San Marcos Germplasm has been analyzed and is classed as a tetraploid (2n=72).

Method of Breeding and/or Selection: San Marcos Germplasm was first evaluated at the Knox City PMC in 1965 along with 11 other accessions. In 1968 forty-four other accessions of the same species were added to the assembly and evaluations were carried out until 1971. In 1971 San Marcos Germplasm was selected as the superior accession based on seed and forage production. Other evaluations from the early 80's up until 1999 have provided additional information on forage production, quality, and adaptability. A seed production field of San Marcos Germplasm was first established at the center in 1972 with additional plantings established in 1974, 1993, and 1994 (See attachment 1 for initial and advanced evaluation summaries and seed production figures).

Environmental Impact Assessment: San Marcos Germplasm eastern gamagrass is a selection of naturally occurring germplasm and has been unaltered from its original collection. San Marcos Germplasm did not meet the assessment of a plant that would become invasive based on literature review and the attached "Invasive Species Worksheet" (see attachment 2).

Conservation Use: San Marcos Germplasm may be used in pure stands for improved pasture and hay plantings or as a component in seed mixtures for range seeding. Its forage value is highly palatable to all livestock and must be managed accordingly to avoid overgrazing. Wildlife can utilize the plants and seed for food. The plants provide good ground nesting cover for quail. San Marcos Germplasm maybe utilized in filterstrips, field borders, contour buffer strips, cross wind trap strips, and riparian forest buffers for nitrogen and phosphorus uptake, and erosion control.

Anticipated Area of Adaptation: San Marcos Germplasm's anticipated areas of adaptation are MLRAs 78B, C, D, 80A, B, 81B, C, 82, 83A, 84B, C, 85, 86A, B, and 87A, B in Texas and southern Oklahoma. San Marcos Germplasm is adapted to a wide range of soil types but will perform best on sandy loams, clay loams, and clay soils. It is well adapted to low, moist sub-irrigated sites.

Availability of Plant Materials: Generation 0 seed (equivalent to Breeder seed) will be maintained by the USDA-NRCS Plant Materials Center at Knox City, Texas and is available in limited quantities to interested parties for increase purposes.

References: Gould, F. W., The Grasses of Texas. TAMU Press, College Station 1975.

USDA-SCS, 1971,100 Native Forage Grasses in 11 Southern States, Ag Handbook No. 139.

USDA-SCS Soil Survey, Comal and Hays Counties Texas, 1984.

Wright, L. S., Cytological, Morphological, and Agronomic Traits of Eastern Gamagrass Accessions, 1977.

Prepared by: USDA-NRCS, Plant Materials Center, 3776 FM 1292, Knox City, TX 79529, 940-658-3922.

Signatures for release of :

San Marcos Germplasm eastern gamagrass (*Tripsacum dactyloides*)

11-23-97

Name
John P. Burt, State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Temple, Texas

Date

3/2/00

Name
Director, Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

Date

Attachment 1: Summary of Initial and Advanced Evaluation of Tnpsacum *dactyloides*, eastern gamagrass

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Accession - Origin	PerformanceRtng/1	Ave/yr./2	Rank/3	%Yield/4	Rank/5	Final Rank/6
PMT-823	51	13	3	1.21	25	15
PMT-824	69	17	7	1.14	26	18
PMT-825	59	15	5	1.13	27	17
PMT-826	65	16	6	1.57	15	10
PMT-827	51	13	3	1.22	24	14
PMT-828	59	15	5	1.4	19	112
PMT-829	39	10	1	2.13	3	2
PMT-830	59	15	5	1.01	28	18
PMT-831				-		
PMT-832 San Marcos Germplasm	41	10	1	2.29	2	1
PMT-833	-			1.73	11	
PMT-1213	61	15	5	1	29	19
PMT-1466	53	12	2	1.13	27	16
PMT-1588	55	14	3	1.67	14	9
PMT-1589						
PMT-1590	55	14	4	1.3	23	14
PMT-1591	55	14	4	1.8	8	6
PMT-1592						
PMT-1593	-					
PMT-1594				-		
PMT-1598	65	17	7	1.76	10	9
PMT-1599	75	19	9	3.29	1	4
PMT-1600	63	16	6	1.51	18	12
PMT-1602	75	19	9			
PMT-1603	79	20	10'	1.25	32	18
PMT-1604						
PMT-1605	69	17	7	1.31	21	15
PMT-1606					-	
PMT-1607	51	13	3	1.77	9	6
PMT-1608						
PMT-1609	55	14	4	1.93	5	3
PMT-1610	67	17	7			
PMT-1611						
PMT-1612	55	14	4	1.81	7	5
PMT-1613	79	20	10			
PMT-1614	79	20	10	1.69	12	11
PMT-1615	61	15	5	1.76	10	7
PMT-1616	67	17	7			
PMT-1617	59	15	5	1.75	11	8
PMT-1618	61	15	5	1.94	4	3
PMT-1619	65	17	7			
PMT-1620	79	20	10	1.53	16	13
PMT-1621	67	17	7			
PMT-1622	71	18	8			

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Accession - Origin	Performance Rtng/1	Ave/yr./2	Rank/3	%Yield/4	Rank/5	Final Rank/6
PMT-1623	67	17	7	1.52	17	12
PMT-1624	69	18	8	1.39	20	15
PMT-1625	85	21	11			
PMT-1626	83	20	10			
PMT-1627						
PMT-1805	79	20	10			
PMT-1806						

/1 Performance rating - Ocular observations on seedling vigor, leaf production, stand and seed production were rated on 1-9 scale from 1968-1971 with 1=best; 9=none.
/2 Average/yr. - Total performance rating divided by 4.
/3 Rank - 1-11 with 1 as best for performance.
/4 Percent of PMT-1213 used as a standard.
/5 Rated 1-29 with 1 best for yield comparison.
/6 Final Rank 1-11 with 1 best - yield rank plus performance rank.

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Month	% crude protein	% Digestibility
April	10.1	70.2
May	12.3	66.4
June	7.6	54.7
July	5.2	48.7
August	6.3	54.4
September	7.0	49.7
October	8.7	51.2

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Accession	1996 lbs./ac	1997 lbs./ac	1998 lbs./ac
434493 - KCPMC	14030	18925	14655
9043629 - ETPMC	6551	14155	3480
9043740 - ETPMC	12119	0	3086
9043762 - ETPMC	15563	24148	11826
9055975 - FLPMC	2121	0	0
9059213 - FLPMC	3548	3640	1445
9059215 - FLPMC	5078	3880	2000
9058465 - ARPMC	8876	18156	12519
9058495 - ARPMC	10868	19418	13241
9058569 - ARPMC	6457	13237	7007
9062708 - MSPMC	7773	13466	6982
9062680 - MSPMC	10820	16041	11978
9066165 - NMPMC	13873	17346	15188
Mean	9052	12187	7951

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Production Years	Average Production lbs./ac	Average Germination
1979 - 1998	215	26

Attachment 2: Invasive Species Worksheet

Proposed release species: San Marcos Germplasm eastern gamagrass

Instructions: Circle item under Yes or No column and follow to conclusion.

	Yes	No
1. Does the species invade elsewhere, outside of North America?	To 13	To 2
2. Is it a specific hybrid with known seed sterility?	To 3	TO 4
3. Does it spread quickly by vegetative means?	To 15	To 16
4. Is it native to parts of North America other than the region of the proposed introduction?	To 5	To 6
5. Does it spread quickly by vegetative means?	To 15	To 16
6. Does it grow very rapidly in its first *two* years?	To 8	To 7
7. Does it reproduce quickly vegetatively?	To 10	To 9
8. Does it reproduce quickly vegetatively?	To 17	To 11
9. Is it in a family or genus with species that are already strongly invasive in North America?	To 15	To 16
10. Do the seeds require pretreatment for germination?	To 12	To 15
11. Do the seeds require pretreatment for germination?	To 15	To 17
12. Is it in a family or genus with species that are already strongly invasive in North America?	To 15	To 16
13. Is it in a family or genus with species that are already strongly invasive in North America?	To 17	To 14
14. Is it native to parts of North America other than the region of the proposed introduction?	To 15	To 17
15. Further analysis/monitoring needed on germplasm		
16. Accept germplasm		
17. Reject germplasm		

Adapted from article - Predicting invasions of woody plants introduced into North America, Conservation Biology Vol. 11:193-203, Feb. 1997.

Reference(s) used for analysis of conclusion:

1. Gould, F. W 1975. The Grasses of Texas. TAMU Press, College Station.

2. USDA-SCS, 1971,100 Native Forage Grasses in 11 Southern States, Ag. Handbook No. 139.

3. Correll and Johnston, Manual of the Vascular Plants of Texas, Texas Research Foundation, 1970.

4. Wright, L. S., Cytological, Morphological, and Agronomic Traits of Eastern Gamagrass Accessions, Masters Thesis, Oklahoma State University, 1977.

5. Hitchcock, A. S., Manual of the Grasses of the United States, US Govt. Printing Office 1950

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